

REMARKS

The present invention relates to a method of using aqueous compositions based on aqueous polymer dispersions as a basecoat for metal components.

As described in the specification beginning at page 1, prenumbered line 10, metal components, especially shaped parts of sheet metal, are frequently coated for various reasons. Such coated metal parts are frequently subjected to various severe mechanical forces and stresses leading to various problems, such as delamination, i.e., the coating delaminates from the metal surface. The present invention addresses these problems.

As recited in above-amended Claim 16, the invention is a method of coating metal components by applying a first coating composition to a surface of the component as to provide a basecoat and then applying at least one further coating composition to the surface provided with the basecoat, which comprises selecting the first coating composition from aqueous compositions, which comprise:

- i) at least one aqueous polymer dispersion comprising at least one addition polymer P which has a glass transition temperature below 0°C and contains in copolymerized form
 - from 80 to 99.5% by weight of at least one monoethylenically unsaturated, hydrophobic monomer A,
 - from 0.5 to 10% by weight of at least one monoethylenically unsaturated monomer B selected from monocarboxylic acids, dicarboxylic acid and their anhydrides, and if desired
 - from 0 to 10% by weight of one or more ethylenically unsaturated monomers C, different than the monomers A and B, the weight fractions of the monomers A, B and C adding up to 100% by weight,

and

at least one water-soluble oxide, hydroxide, salt or complex salt of an at least divalent metal cation, and

wherein said at least one further coating composition comprises as binder at least one aqueous dispersion of an addition polymer P' having a glass transition temperature in the range from 10°C to 80°C.

Applicants have provided comparative data in the specification which shows that with the present invention, i.e., wherein the first coating composition is applied as a primer, resistance to delamination is significantly better compared to the use of primer compositions not containing the presently-recited component ii), even when the glass transition temperature of the addition polymer is below 0° C. See dispersion VD5, at Table 1 at page 23 of the specification. VD1 through VD5 are comparison dispersions; ED1 and ED2 are according to the invention. Table 2, which shows the results of testing described at page 25, line 12ff, at pages 25-26 of the specification, is reproduced as follows:

Table 2: Results of performance testing

Example	First composition/ dispersion	Second formulation/ dispersion	Delamination
V1	VD1	D6	4
V2	VD2	D6	4
V3	VD3	D6	4
V4	VD4	D6	4-5
V5	VD3/VD5	D6	3
B1	ED1	D6	1
B2	ED2	D6	1
B3	ED1	D7	1
B4	ED2	D7	1

V1-V5 are for purposes of comparison; B1-B4 are according to the invention. The above-discussed comparative results could not have been predicted by the applied prior art.

The rejection of Claims 2-9 and 11-20 under 35 U.S.C. § 103(a) as unpatentable over U.S. 6,291,018 (Dattilo) and incorporated by reference U.S. 5,196,485 (McMonigal et al) in view of U.S. 5,162,415 (Rehmer et al), is respectfully traversed. Dattilo is drawn to a method of forming a composite coating having a polychromatic effect over a substrate. Dattilo's invention involves a drying technique for drying a first liquid base coat material prior to applying a second liquid base coat material. Particularly, the first base coat is dried in a drying chamber having a temperature between about 50° F and 90° F, a relative humidity of about 40 to 80% and an air velocity of about 20 to 150 FPM, for a period of about 10 to 180 seconds (column 2, lines 10-19). Dattilo discloses that his first base coat material preferably comprises a crosslinkable coating composition comprising at least one thermosetting film-forming material such as, *inter alia*, acrylics and at least one crosslinking material (column 4, lines 19-24). Dattilo describes a number of suitable acrylic polymers and also makes reference to McMonigal et al (column 4, lines 39-42). Neither Dattilo nor McMonigal et al suggests the presence of at least one water-soluble oxide, hydroxide, salt or complex salt of an at least divalent metal cation. The Examiner thus relies on Rehmer et al.

Rehmer et al is described in the specification herein as disclosing an aqueous composition which can be used as the presently-recited first coating composition. See the specification herein at page 4, line 5, wherein DE-A 3930585 is the German equivalent of Rehmer et al.

Given the literally countless possibilities for Dattilo's first liquid base coat material, it is only with the present disclosure as a guide that one skilled in the art would choose the aqueous synthetic resin formulation of Rehmer et al. Moreover, even though Rehmer et al disclose their formulations as having resilience in the solidified state, essentially constant elongation at break, high water resistance, and particularly suitable for coating, adhesive bonding, sealing or impregnating substrates such as metal (column 13, lines 12-26), Rehmer

et al discloses and suggests nothing regarding their coatings as a base coat for a subsequent coating, let alone one obtained from a coating composition comprising as binder at least one aqueous dispersion of an addition polymer having a glass transition temperature in the range of from 10°C to 80°C. Moreover, to the extent the Examiner relies on McMonigal et al as disclosing or suggesting the presently-recited at least one further coating composition, it appears that Dattilo relies on McMonigal et al only for their disclosure of a base coat, in view of the disclosure at column 6, lines 16-20 of Dattilo.

While a person skilled in the art may or may not have expected that the presently-recited base coat would have good adhesion to metal surfaces, it is quite surprising that the at least one further coating shows good adherence to the base coat.

In addition, the Examiner finds that Dattilo discloses coating a metal with a first base coat and a second base coat, wherein the second base coat has a glass transition temperature of more than 20°C. However, the Examiner's assertion with regard to the glass transition temperature of the second base coat is not well taken for the following reasons. As a matter of fact, Dattilo is silent with regard to the glass transition temperature of either the first or the second base coat. The Examiner's assertion is based on the incorporation by reference McMonigal et al. Indeed, McMonigal et al disclose a glass transition temperature of more than 20°C at column 3, line 19. However, this glass transition temperature is not related to those polymers of McMonigal et al which were incorporated by reference into Dattilo, but to another polymer which is the top coat of McMonigal et al's coating. As a matter of fact, McMonigal et al discloses a process for applying a composite coating to a substrate which includes applying an acid catalyzed thermosetting film forming composition to a substrate to form a base coat followed by applying a stable edge-resistant film-forming composition to the base coat. This top coat includes a polyepoxide (column 1, line 66 to column 2, line 7) which has a glass transition temperature of more than 20°C. A polyepoxide, however, is

neither an addition polymer nor an aqueous polymer dispersion as in the claimed process. Moreover, Dattilo does not make reference to this top coat epoxy polymer but to the base coat polymer (see column 4, line 41 which makes reference to McMonigal et al column 11, lines 16-60 and column 6, line 18 of Dattilo, which makes reference to column 11, line 7 to column 13, line 22 of McMonigal et al). These parts of McMonigal et al clearly relate to the base coat of McMonigal et al (and not to the top-coat) and these parts do not disclose a glass transition temperature of least 20°C. Thus, the combination of Dattilo and Rehmer et al (even if McMonigal et al is incorporated therein) does not lead to the claimed invention.

Furthermore, the Examiner incorrectly asserts that Rehmer et al teaches coating compositions that do not crack under external temperature changes. This assertion, again is not well taken for the following reasons: Rehmer et al discloses at column 13, lines 12-28 that the coatings have a constant elongation at break. No disclosure is made, however, about crack under external temperature changes. Rehmer et al discloses at column 13, lines 31 ff, that the formulation ensures permanent covering of cracks. However, this text passage relates to coating of walls, floors, ceilings, marking paints for paths and roads etc. It does not relate to the coating of metal. Therefore, a skilled person would not have concluded that the coatings of Rehmer et al show a good adherence to metal surfaces, let alone that delamination of a second coating is diminished when Rehmer et al's coatings are used as a base coat.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 2-10, 13-16 and 18-20 under 35 U.S.C. § 103(a) as unpatentable over JP 52-93122 (Ishikawa) in view of Rehmer et al, is respectfully traversed. Ishikawa discloses a coated metal plate comprising a base plate such as surface-treated steel, a resin coating, a granule layer and an outer resin coating. The resin coating may be, *inter alia*, of an epoxy resin, polyester resin, acrylic resin and urethane resin. The disclosures and

deficiencies of Rehmer et al have been discussed above. Rehmer et al does not cure the deficiencies of Ishikawa.

The present claims require that the at least one further coating composition be applied **to the surface** provided with the base coat. Ishikawa, on the other hand, includes a granule layer between their base resin coating and their outer resin coating. Thus, it would appear that Ishikawa's outer resin coating is not applied to the surface of his base resin coating. Nevertheless, even if there was no intermediate granule layer, the possibilities for the two, respective resin coatings of Ishikawa are essentially limitless. It is only with the present disclosure as a guide that one skilled in the art would choose the formulation of Rehmer et al to prepare the presently-recited base coat. And, neither Ishikawa nor Rehmer et al disclose or suggest anything with regard to the presently-recited at least one further coating composition.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

All of the presently-pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

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